

REMARKS

Claims 5-7, 15-17, 19 and 20 are all the claims pending in the application, prior to the present Amendment.

Claims 5, 6, 17, 19 and 20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0125479 A1 to Kinsho et al.

Applicants submit that Kinsho et al do render obvious the subject matter of the above claims and, accordingly, request withdrawal of this rejection.

Applicants have amended claim 5 to state that the dry-blending of the thermoplastic polyurethane resin powder (B) and the fine particle powder is at room temperature to further distinguish the product from Kinsho et al. Support this amendment can be found at page 37, Example 1 where the resulting mixture was cooled to a “room temperature” and after cooling, fine particle powder was added and mixed to obtain a resin powder composition (S1) for slush molding.

Applicants have also added new claim 21 directed to the powdered resin composition, wherein the fine particle powder (E) of a vinyl type copolymer has a volume average particle diameter in a range from 3 μm to 5 μm . This embodiment is clearly distinguished from Kinsho's particles with respect to the hypothetical surface covering rate of resin particles (E) on the surface of resin particles (B).

Support for claim 21 can be found in Production Examples 2-4 of the present specification.

In addition, applicants have added new claims 22 to 24 directed to a method for producing the composition by dry-blending a thermoplastic polyurethane resin powder (B) and a fine particle powder (E).

Support for new claims 22 to 24 can be found on pages 29-30 in paragraphs [0062] and [0063] of the present specification and original claim 11.

Thus, the present invention as set forth in claim 5 is directed to a powdered resin composition for slush molding comprising a thermoplastic polyurethane resin powder (B) as the main component and a fine particle powder (E) of a vinyl type copolymer comprising a copolymer of an alkyl (meth)acrylate and a hydroxyl-containing vinyl type monomer and having a cross-linked structure as a powder flowability improver, wherein the fine particle powder (E) is not melted in the temperature range of 200 to 300°C, the resin powder (B) has a volume average particle diameter in a range from 70 to 300 µm and is capable of melting at 200 to 300°C, and the thermoplastic polyurethane resin powder (B) and the fine particle powder are dry-blended at room temperature, wherein the fine particle powder (E) of a vinyl type copolymer is contained in an amount from 0.1% by weight to 1.5% by weight to the thermoplastic polyurethane resin powder (B).

Applicants submit that Kinsho et al do not disclose or suggest the powdered resin composition for slush molding of the present invention comprising a thermoplastic polyurethane resin powder (B) as the main component and a fine particle powder (E) of a vinyl type copolymer comprising a copolymer of an alkyl (meth)acrylate and a hydroxyl-containing vinyl type monomer and having a cross-linked structure as a powder flowability improver, wherein the thermoplastic polyurethane resin powder (B) and the fine particle powder are dry-blended at room temperature.

In the present Office Action, the Examiner asserts in the sentence beginning on line 4 of page 6 of the Office Action that dry blending is a product-by-process limitation which is only relevant towards the limitations it implies are present in the final product, and in the sentence

beginning at line 11 on page 6 of the Office Action that the term “dry-blended” does not imply that the final mixture does not contain some or all of the particles adhered to one another.

In response, applicants point out that claim 5 as amended above recites that the fine particle powder (E) which is not melted in the temperature range of 200 to 300°C and the resin powder (B) which is capable of melting at 200 to 300°C are dry-blended at room temperature. The fine particle powder (E) and the resin powder (B) are not melted under this condition. Accordingly, dry-blending powder (B) and powder (E) at room temperature produces a final mixture containing essentially no particles adhered to one another.

This position is further confirmed by the fact that the powders of Examples 1-7 of the present specification have good Repose angle and Storage stability. If the powder (E) adheres to a softened powder (B), then the softened powder (B) might adhere to one another and the resulting composition might have no good Repose angle and Storage stability.

The Examiner argues that Example 1 of the present specification indicates that in the present invention, the two powders form a dry-blended powder mixture that has a diameter larger than the individual powders. The Examiner asserts that this indicates that in the present invention the two powders attach to each other, which according to the Examiner is the same as in Kinsho et al.

In response, applicants point out that the particle diameter of the mixture in Examples 2, 4, 5, 6 and 7 of the present specification is, respectively, 140 µm, 150 µm, 151 µm, 151 µm and 150 µm, which means that the powder mixture of these Examples has the same or a smaller size than the individual powders that formed the mixture. Each of these Examples employed the same polymer (B-1) having a particle diameter of 151 µm as Example 1, but with different vinyl type copolymers. Also, in Examples 2 and 6 of Kinsho et al, the resin particles formed from the

individual resin particles (A) and (B) did not have an increased particle diameter. So, it can not be said from the result of Example 1 of the present specification that the mixture particle becomes larger. Rather, the measurement done by the Examples can not sufficiently precisely distinguish the particle diameter of adhered ones from individual ones. The inventors of the present invention have opined that the measurement error may be about 3% (about 5 μm in 150 μm).

In addition, with respect to new claim 21, the particle diameter of the particle (E) is defined as in a range from 3 μm to 5 μm . Consequently, this embodiment defines that the resin powder (B) has a volume average particle diameter in a range from 70 to 300 μm , the fine particle powder (E) has a volume average particle diameter in a range from 3 μm to 5 μm , and the fine particle powder (E) is contained in an amount from 0.1% by weight to 1.5% by weight to the resin powder (B). Accordingly, one can estimate the hypothetical surface covering rate of resin particles (E) on the surface of resin particles (B) by the following.

Assuming that the particles (E) and (B), wherein the size of the particle (B) is sufficiently larger than the size of the particle (E), are spherical particles and have the same mass/volume density, and assuming that all particles (E) are adhered to the particles (B), then the hypothetical surface covering rate of resin particles (E) on the surface of resin particles (B) can be defined as follow:

the hypothetical surface covering rate (%) \doteq (volume average particle diameter of B in μm) x (amount of E/amount of B)/((volume average particle diameter of E in μm) x (π))

For example, if one calculates the hypothetical surface covering rate (%) of Example 1 of the present specification by using the number of 151 μm as the diameter of (B) in an amount of 100 parts and the number of 20 μm as the diameter of (E) in an amount of 1 part, then the result

is 2-3%. In the same way, the figures with respect to claim 21 will give a hypothetical surface covering rate (%) which is far smaller than the 85-100% disclosed in Table 1 of Kinsho et al.

From this, it can be seen that the powder of the present invention is different from those of Kinsho et al.

The Examiner further asserts that in Kinsho et al, the two powders are “statically charged” to each other, and that one would expect the same static charge in the present invention. Thus, the Examiner alleges that there is the possibility that in the present invention statically charged particles adhere to one another. It seems that the Examiner is of the opinion that such statically adhered particles may be the same as the Kinsho et al particles.

In response, applicants point out that in the Kinsho et al process, particles are dispersed in water to make the Kinsho et al particles. In paragraph [0303], Kinsho et al disclose as follows:

The covering rate and depth [of embedment of resin particles (A) in resin particles (B)] can be increased by imparting opposite static charges to resin particles (A) and (B) in the production of said aqueous dispersion (X1). The increase in covering rate and depth becomes greater as the charges of resin particles (A) and (B) are respectively increased. (Emphasis added).

From the above description in Kinsho et al, it is apparent that the ordinary static electric force in the air does not work to make the particles of Kinsho et al, because the Kinsho et al process is performed in an aqueous medium and depth can be increased, which is not the case in the dry-blending process of the present invention at room temperature.

In addition, during the dry-blending process at room temperature of the present invention, the thermoplastic polyurethane resin powder (B) and the fine particle powder (E) of a vinyl type copolymer comprising a copolymer of an alkyl (meth)acrylate and a hydroxyl-containing vinyl type monomer do not statically adhere to each other because opposite static charges among

particles does not happen. Moreover, even if one supposes that it happens, oppositely charged particles would collide and simultaneously neutralize their charge and might become charge-less particles.

In view of the above, applicants submit that Kinsho et al do render obvious the subject matter of the above claims and, accordingly, request withdrawal of this rejection.

The Examiner repeats the following two rejections from the previous Office Action.

Claim 16 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho et al (US 2003/0125479 A1) with further evidence provided by Toyama et al (US 4,686,138).

Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho et al (US 2003/0125479 A1) in view of Suling et al (US 4,233,424).

Claims 16, 7 and 15 each depend from claim 5. Applicants submit that these claims are patentable over Kinsho et al at least for the same reasons that claim 5 is patentable over Kinsho et al. Further, Toyama et al and Suling et al do not supply the above discussed deficiencies of Kinsho et al.

Accordingly, applicants request withdrawal of these rejections.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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